



Atty. Docket No. SHA01 P-346A

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April 8, 2005  
Date

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Art Unit : 3612  
Examiner : Dennis H. Pedder  
Applicant : Darin Evans  
Appln. No. : 10/715,002  
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SUPPLEMENTAL APPEAL BRIEF (37 CFR §41.37)

This brief is in furtherance of the Appeal Brief filed February 28, 2005 in this case and the Notification of Non-Compliant Appeal Brief mailed March 25, 2005.

The fees required under §41.20(b)(2) have already been submitted and no additional fees are due. However, if there is any fee due in connection with the filing of this document, please charge the fee to our Deposit Account No. 16-2463.

This brief contains these items under the following headings, and in the order set forth below (37 CFR §41.37(c)):

- I. Real Party in Interest
- II. Related Appeals and Interferences
- III. Status of Claims
- IV. Status of Amendments
- V. Summary of Claimed Subject Matter
- VI. Grounds of Rejection to Be Reviewed on Appeal

Applicant : Darin Evans  
Appln. No. : 10/715,002  
Page : 2

## **VII. Argument**

Appendix of Claims Involved in the Appeal

Related Proceedings Appendix (35 USC §41.37(c))

Evidence Appendix (35 USC §41.37(c))

The final page of this brief bears the attorney's signature.

### **I. Real Party in Interest**

The real party in interest in this application is Shape Corporation, the assignment to which was recorded in the parent application at Reel 013164, Frame 0870.

### **II. Related Appeals and Interferences**

There are no related appeals or interferences pending during this application.

### **III. Status of Claims**

Claims 1-31 are pending in the present application. All pending claims are the subject of this appeal and have been finally rejected.

### **IV. Status of Amendments**

An Amendment After Final was filed on November 19, 2004, in which claims 25 and 27-31 were amended. In an Advisory Action mailed December 10, 2004, the Examiner stated that for purposes of appeal, the proposed amendments made in the Amendment After Final will be entered.

### **V. Summary of Claimed Subject Matter**

As described in the specification portion of the application (pages 1-10), and illustrated in the related figures (Figs. 1-10), the invention recited in the finally rejected claims relates to a bumper for reducing pedestrian injury.

Applicant : Darin Evans  
Appln. No. : 10/715,002  
Page : 3

An aspect of the present invention is to provide a bumper system 20 for a vehicle comprising a beam 21 for attachment to a vehicle; an energy absorber 22 engaging a face of the beam 21 (see paragraph 16 of the present specification); the energy absorber 22 having a top horizontal section 23 defined by a top wall 52 and an upper-mid wall 53 connected by an upper-front wall 54, and having a bottom horizontal section 24 defined by a bottom wall 55 and a lower-mid wall 56 connected by a lower-front wall 57, and further having a middle horizontal section 25 defined by a mid-front wall 58 connecting the upper-mid wall 53 and the lower-mid wall 56, the top and bottom horizontal sections 23, 24 including top and bottom front nose portions 26, 27 that extend forward of the mid-front wall 58 and that define a horizontal channel 58' therebetween in front of the mid-front wall 58. The front nose portions 26, 27 are configured to provide a first level of energy absorption during an initial impact stroke that collapses one or both of the front nose portions 26, 27, and the top, middle, and bottom horizontal sections 23-25 providing a higher second level of energy absorption during a continuing impact stroke that collapses the energy absorber 22 against the face of the beam 21 (see paragraphs 20-22 of the present specification). A fascia 50 covers the energy absorber 22 and the beam 21, whereby, during an initial front impact stroke, the top and bottom front nose portions 26, 27 provide a relatively low-energy absorption that contacts an impacted object, and then during a further continuing impact stroke, the top, middle, and bottom horizontal sections 23-25 crush to provide an increased energy absorption (see paragraph 16 of the present specification).

Another aspect of the present invention is to provide a bumper system 20 for a vehicle comprising a beam 21 for attachment to a vehicle and having a longitudinal curvature that, when viewed from above in a vehicle-mounted position, is shaped to match an aerodynamic curvilinear shape of a front of the vehicle. An energy absorber 22 engages a face of the beam 21 (see paragraph 16 of the present specification). The energy absorber 22 has a top horizontal section 23 defined by a top wall 52 and an upper-mid wall 53 connected by an upper-front wall 54, and has a bottom horizontal section 24 defined by a bottom wall 55 and a lower-mid wall 56 connected by a lower-front wall 57, the top and bottom horizontal sections 23, 24 including top and bottom front nose portions 26, 27 that extend forwardly (see paragraphs 16 and 20-22

Applicant : Darin Evans  
Appln. No. : 10/715,002  
Page : 4

of the present specification). The top and bottom front nose portions 26, 27 each are semi-rigid but collapsible with a parallelogram motion that shifts one or both of the upper-front and lower-front walls 54, 57 vertically, such that horizontal impact forces are converted at least in part to a vertical force upon receiving a horizontal frontal impact during an initial stroke of the frontal impact, whereby, during a first part of the frontal impact, the top and bottom front nose portions 26, 27 provide a relatively low-energy absorption that contacts an impacted object, and then during a further continuing impact stroke, the top and bottom horizontal sections 23, 24 crush to provide an increased energy absorption (see paragraphs 20-22 of the present specification).

Yet another aspect of the present invention is to provide a method comprising steps of constructing a bumper system 20 including a stiff beam 21 and an energy absorber 22 on a face of the beam 21, the energy absorber 22 having top, middle, and bottom sections 23, 25, 24, with the top and bottom sections 23, 24 defining nose portions 26, 27 that extend forward of the middle section 25, the nose portions 26, 27 defining a space therebetween in front of the middle section 25, the nose portions 26, 27 being constructed to deflect with a parallelogram motion upon impact (see paragraphs 16 and 20-22 of the present specification); and shifting at least one of the nose portions 26, 27 vertically with a parallelogram motion in response to an impact directed horizontally against a front of the bumper system 20, whereby energy directed against a knee of an impacted person is converted into a throwing force that directs the person in a direction generally perpendicular to the line of impact and away from the vehicle bumper system 20 (see paragraphs 20-22 of the present specification).

A further aspect of the present invention is to provide a bumper system 20 for a vehicle comprising a bumper beam 21 for attachment to a vehicle; and an energy absorber 22 attached to a face of the bumper beam 21, the energy absorber 22 including at least one section 23, 24 having parallel upper and lower walls that extend generally perpendicular to the face of the bumper beam 20 and having a main front wall and an angled front wall connecting a front edge of the upper and lower walls, the main front wall and the angled front wall forming a non-planer front surface that, upon a front impact against a pedestrian's knee, causes a structural collapse where the upper and lower walls flex with a parallelogram motion, the parallelogram

Applicant : Darin Evans  
Appln. No. : 10/715,002  
Page : 5

motion redirecting and converting an impact force that is initially horizontal against the knee into an upward vertical force (see paragraphs 16 and 20-22 of the present specification).

Another aspect of the present invention is to provide a bumper system for a vehicle comprising a bumper beam 21 for attachment to a vehicle; and an energy absorber 22 attached to a face of the bumper beam 21, the energy absorber 22 including at least one section 23, 24 having parallel upper and lower walls that extend generally perpendicular to the face of the bumper beam 21 and having a front wall (see paragraph 16 of the present specification). The upper and lower walls are elongated and longer than the front wall and further the upper and lower walls and the front wall being joined to collapse with a parallelogram motion so that, upon a front impact against a pedestrian's knee and leg, the upper and lower walls flex with a parallelogram motion, the parallelogram motion redirecting and converting impact forces that are initially horizontal against the knee into vertical forces less damaging to the pedestrian's knee and leg (see paragraphs 20-22 of the present specification).

## **VI. Grounds of Rejection to Be Reviewed on Appeal**

Claims 7-21 and 27-31 have been rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Claims 1, 5-8 and 15-21 have been rejected as being unpatentable over UK Patent Application No. 2,081,653 (hereinafter referred to as "the UK patent application").

Claim 3 has been rejected under 35 U.S.C. §103(a) as being unpatentable over the UK patent application.

Claim 4 has been rejected under 35 U.S.C. §102(b) as being anticipated by, or, in the alternative, under 35 U.S.C. §103(a) as being obvious over, the UK patent application.

Claims 9 and 11-14 have been rejected under 35 U.S.C. §103(a) as being unpatentable over the UK patent application in view of U.S. Patent No. 5,092,512 to Sturrus et al. (hereinafter referred to as "the Sturrus et al. '512 patent").

Claims 2 and 10 have been rejected under 35 U.S.C. §103(a) as being unpatentable over the UK patent application in view of Japanese Publication No. 57-172848 (hereinafter referred to

Applicant : Darin Evans  
Appln. No. : 10/715,002  
Page : 6

as “the Japanese ‘848 publication”) or over the UK patent application in view of the Sturuss et al. ‘512 patent and the Japanese ‘848 publication.

Claims 22-26 have been rejected under 35 U.S.C. §103(a) as being unpatentable over the UK patent application in view of U.S. Patent No. 5,799,991 to Glance (hereinafter referred to as “the Glance ‘991 patent”) or over the UK patent application in view of the Sturuss et al. ‘512 patent and the Glance ‘991 patent.

## **VII. Argument**

### **A. Rejection of Claims 7-21 and 27-31 under 35 U.S.C. §112, Second Paragraph**

Claims 7-21 and 27-31 have been rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. The second paragraph of 35 U.S.C. §112 states that claims must particularly point out and distinctly claim the invention. According to §2173 of the M.P.E.P., “[t]he primary purpose of this requirement of definiteness of claim language is to ensure that the scope of the claims is clear so the public is informed of the boundaries of what constitutes infringement of the patent.” M.P.E.P. §2173.01 provides further guidance as to what is required under 35 U.S.C. §112, second paragraph. Specifically, M.P.E.P. §2173.01 states:

[Applicants] can define in the claims what they regard as their invention essentially in whatever terms they choose so long as the terms are not used in ways that are contrary to accepted meanings in the art. Applicant may use functional language, alternative expressions, negative limitations, or any style of expression or format of claim which makes clear the boundaries of the subject matter for which protection is sought. As noted by the court in *In re Swinehart*, 439 F.2d 210, 160 USPQ 226 (CCPA 1971), a claim may not be rejected solely because of the type of language used to define the subject matter for which patent protection is sought.

Furthermore, M.P.E.P. §2173.02 provides guidance for the Examiner for reviewing a claim for definiteness. Specifically, M.P.E.P. §2173.02 states:

The examiner's focus during examination of claims for compliance with the requirement for definiteness of 35 U.S.C. 112, second paragraph is whether the

Applicant : Darin Evans  
Appln. No. : 10/715,002  
Page : 7

claim meets the threshold requirements of clarity and precision, not whether more suitable language or modes of expression are available. When the examiner is satisfied that patentable subject matter is disclosed, and it is apparent to the examiner that the claims are directed to such patentable subject matter, he or she should allow claims which define the patentable subject matter with a reasonable degree of particularity and distinctness. Some latitude in the manner of expression and the aptness of terms should be permitted even though the claim language is not as precise as the examiner might desire. . . . In reviewing a claim for compliance with 35 U.S.C. 112, second paragraph, the examiner must consider the claim as a whole to determine whether the claim apprises one of ordinary skill in the art of its scope and, therefore, serves the notice function required by 35 U.S.C. 112, second paragraph by providing clear warning to others as to what constitutes infringement of the patent. See, e.g., *Solomon v. Kimberly-Clark Corp.*, 216 F.3d 1372, 1379, 55 USPQ2d 1279, 1283 (Fed. Cir. 2000). See also *In re Larsen*, No. 01-1092 (Fed. Cir. May 9, 2001) (unpublished) . . . If the language of the claim is such that a person of ordinary skill in the art could not interpret the metes and bounds of the claim so as to understand how to avoid infringement, a rejection of the claim under 35 U.S.C. 112, second paragraph would be appropriate. See *Morton Int'l, Inc. v. Cardinal Chem. Co.*, 5 F.3d 1464, 1470, 28 USPQ2d 1190, 1195 (Fed. Cir. 1993). However, if the language used by applicant satisfies the statutory requirements of 35 U.S.C. 112, second paragraph, but the examiner merely wants the applicant to improve the clarity or precision of the language used, the claim must not be rejected under 35 U.S.C. 112.

In view of the requirements for definiteness stated above, Applicant submits that all pending claims are clearly definite.

#### Claims 7-14

According to the last Office Action, claims 7-14 are rejected because the “[r]ecitation ‘collapsible with a parallelogram motion’ is indefinite.” Paragraph 2, page 2 of the Office Action mailed September 29, 2004. Applicant submits that all of the claim language referenced in the Office Action in claims 7-14 is definite.

Claim 7 defines a bumper system including an energy absorber having a top horizontal section defined by a top wall and an upper-mid wall connected by an upper-front wall, and having a bottom horizontal section defined by a bottom wall and a lower-mid wall connected by a lower-front wall, and further having a middle horizontal section defined by a mid-front

Applicant : Darin Evans  
Appln. No. : 10/715,002  
Page : 8

wall connecting the upper-mid wall and the lower-mid wall, the top and bottom horizontal sections including top and bottom front nose portions that extend forward of the mid-front wall and that define a horizontal channel therebetween in front of the mid-front wall, wherein the top and bottom nose portions are semi-rigid but collapsible with a parallelogram motion that shifts one or both of the upper and lower front walls vertically.

Clearly, a person of ordinary skill in the art could interpret the metes and bounds of this claim so as to understand how to avoid infringement, and thus this phrase is definite. Notably, the Examiner has not pointed out why the language of claim 7 is not definite. According to the Examiner, “[c]laim 7 is incorrect as there is no parallelogram motion disclosed.” Paragraph 2, page 2 of the Office Action mailed September 29, 2004. The Examiner has only stated that the language recited is not disclosed in the present application. However, this is not a proper justification for rejecting a claim as being indefinite under 35 U.S.C. §112, second paragraph.

Nevertheless, top and bottom nose portions of an energy absorber that are collapsible with a parallelogram motion are disclosed in the present application. As illustrated in FIGS. 3 and 4 of the present application, the nose portion 26 includes a front wall 54. The nose portion 26 also includes a portion of the top wall 52 and a portion of the upper-mid wall 53 of the top horizontal section 23. As illustrated in FIG. 4, as the nose portion 26 collapses, the portion of the top wall 52 and the portion of the upper-mid wall 53 that comprise the nose portion remain parallel. Furthermore, the front wall 54 of the upper nose section moves with the portions of the top wall 52 and the upper-mid wall 53 that form part of the upper nose section to maintain approximately the same angle therebetween as shown in FIG. 4. While there is no wall shown in Fig. 4 opposite to the front wall 54, a rearmost boundary defining the nose portion of the top horizontal section 23 remains parallel with the front wall 54 as the top nose portion collapses. Accordingly, a parallelogram motion is disclosed and the phrase “collapsible with a parallelogram motion” is definite.

Therefore, this claim language in claim 7 apprises one of ordinary skill in the art of its scope and provides clear warning to others as to what constitutes infringement of the claim, and this phrase is definite. Accordingly, claim 7 is definite. Furthermore, claim 8 depends



Applicant : Darin Evans  
Appln. No. : 10/715,002  
Page : 9

from claim 7 and has not been individually rejected as being indefinite. Therefore, since claim 7 is definite, claim 8 is definite.

Claim 9 also includes the phrase “collapsible with a parallelogram motion.” As stated above in regard to claim 7, this phrase is definite. Accordingly, claim 9 is definite. Furthermore, claims 10-13 and 28 depend from claim 9 and have not been individually rejected as being indefinite. Therefore, since claim 9 is definite, claims 10-13 and 28 are definite.

Claim 9 has also been rejected because, according to the final Office Action, the “top and bottom front walls” lacks antecedent basis. However, claim 9 does not include this phrase. Accordingly, claim 9 is believed to be definite.

#### Claim 14

According to the final Office Action, claim 14 has been rejected because the phrase “mid-horizontal section” lacks antecedent basis. However, claim 14 was amended to provide antecedent basis for the phrase “mid-horizontal section.” This has never been acknowledged by the Examiner. Nevertheless, claim 14 is believed to be definite.

#### Claim 15

According to the final Office Action, claim 15 has been rejected because the phrase “nose sections” lacks antecedent basis. However, claim 15 has been amended to remove this phrase. This has never been acknowledged by the Examiner. Nevertheless, claim 15 is believed to be definite.

According to the final Office Action, claim 15 has also been rejected as being indefinite because “[c]laim 15 is also not disclosed.” Paragraph 2, page 2 of the Office Action mailed September 29, 2004. Notably, the Examiner has not pointed out why the language of claim 15 is not definite. The Examiner has only stated that the language recited in claim 15 is not disclosed in the present application. However, this is not a proper justification for rejecting a claim as being indefinite under 35 U.S.C. §112, second paragraph. Nevertheless, Applicant submits that all of the claim language referenced in the Office Action in claim 15 is definite.

Applicant : Darin Evans  
Appln. No. : 10/715,002  
Page : 10

Claim 15 defines a method comprising constructing a bumper system including a stiff beam and an energy absorber on a face of the beam, the energy absorber having top, middle, and bottom sections, with the top and bottom sections defining nose portions that extend forward of the middle section, and shifting at least one of the nose portions vertically with a parallelogram motion in response to an impact directed horizontally against a front of the bumper system, whereby energy directed against a knee of an impacted person is converted into a throwing force that directs the person in a direction generally perpendicular to the line of impact and away from the vehicle bumper system.

According to the final Office Action:

Claim 15 is also not disclosed as there is no throwing force, merely a force resolution 31, 31' as disclosed for figure 4. Further, inasmuch as the force 31' is restricted from moving the person downward because of the ground beneath, and due to the majority of the weight of the person being above the knee, the impact would direct the person into the automobile, not upwardly. In greater detail for applicant's apparently necessary edification, no structural distinction is disclosed for the upper and lower horizontal sections. As a result, the force resolutions 31 and 31' are necessarily equal. Force 31 is therefore counteracted by force 31' and no throwing force is resultant. There is necessarily a pushing force component which would push the knee to the left in figure 4 and result in the above mentioned torso movement toward the automobile.

Paragraph 2, pages 2-3 of the Office Action mailed September 29, 2004.

However, the present application discloses that energy directed against a knee of an impact person is converted into a throwing force that directs the person in a direction generally to the side or perpendicular to the line of impact and away from the vehicle bumper system.

Applicant notes that claim 15 does not state that a person would be directed upwardly.

Clearly, a person of ordinary skill in the art could interpret the metes and bounds of this claim so as to understand how to avoid infringement and thus this phrase is definite. Accordingly, Applicant submits that claim 15 is definite as defined by the second paragraph of 35 U.S.C. §112.

Applicant : Darin Evans  
Appln. No. : 10/715,002  
Page : 11

#### Claim 16

Claim 16 has been rejected as being indefinite because “no upward plural forces are apparently disclosed as the disclosure has force 31 only.” Paragraph 2, page 3 of the Office Action mailed September 29, 2004. Claim 16 has been amended to state that the parallelogram motion redirects and converts “an impact force that is initially horizontal against the knee into an upward vertical force.” This has never been acknowledged by the Examiner. Applicant submits, however, that in the context of claim 16, “forces” and “force” are synonymous as there is an upward force 31 for each impact force. Nevertheless, claim 16 is believed to be definite. Furthermore, claims 17-20 depend from claim 16 and have not been individually rejected as being indefinite. Therefore, since claim 16 is definite, claims 17-20 are definite.

#### Claim 21

Claim 21 has been rejected as “lack[ing] a clear frame of reference for ‘longer than the front wall.’” Paragraph 2, page 3 of the Office Action mailed September 29, 2004. Claim 21 states that “the energy absorber includes at least one section having parallel upper and lower walls . . . and having a front wall; the upper and lower walls being elongated and longer than the front wall.” Accordingly, the upper and lower walls are longer than the front wall. Therefore, Applicant submits that claim 21 is definite as written.

#### Claims 27-31

According to the final Office Action, claims 27-31 have been rejected because the term “thin” lacks a frame of reference. However, claims 27-31 have been amended to remove this phrase. Accordingly, claims 27-31 are believed to be definite.

#### **B. Rejection of Claims 1, 5-8 and 15-21 as Being Unpatentable Over the UK Patent Application**

According to the Office Action, claims 1, 5-8 and 15-21 have been rejected under 35 U.S.C. §102(b) as being anticipated by the UK patent application. "Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed

Applicant : Darin Evans  
Appln. No. : 10/715,002  
Page : 12

invention, *arranged as in the claim.*" *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 U.S.P.Q. 481, 485 (Fed. Cir. 1984) (emphasis added).

Applicant respectfully asserts that the Examiner has not yet met his burden of establishing a prima facie case of anticipation with respect to the rejected claims.

#### Claim 1, 5 and 6

Claim 1 defines a bumper system for a vehicle including, among other things, a beam for attachment to a vehicle, an energy absorber engaging a face of the beam; the energy absorber having a top horizontal section defined by a top wall and an upper-mid wall connected by an upper-front wall, and having a bottom horizontal section defined by a bottom wall and a lower-mid wall connected by a lower-front wall, and further having a middle horizontal section defined by a mid-front wall connecting the upper-mid wall and the lower-mid wall, the top and bottom horizontal sections including top and bottom front nose portions that extend forward of the mid-front wall and that define a horizontal channel therebetween in front of the mid-front wall, the front nose portions being configured to provide a first level of energy absorption during an initial impact stroke that collapses one or both of the front nose portions, and the top, middle, and bottom horizontal sections providing a higher second level of energy absorption during a continuing impact stroke that collapses the energy absorber against the face of the beam, and a fascia covering the energy absorber and the beam, whereby, during an initial front impact stroke, the top and bottom front nose portions provide a relatively low-energy absorption that contacts an impacted object, and then during a further continuing impact stroke, the top, middle, and bottom horizontal sections crush to provide an increased energy absorption.

The prior art of record does not disclose or suggest the above noted features of claim 1. Specifically, the UK patent application does not disclose front nose portions being configured to provide a first level of energy absorption during an initial impact stroke that collapses one or both of the front nose portions, and the top, middle, and bottom horizontal sections providing a higher second level of energy absorption during a continuing impact stroke that collapses the energy absorber against the face of the beam. Furthermore, the prior art of record does not

Applicant : Darin Evans  
Appln. No. : 10/715,002  
Page : 13

disclose or suggest top and bottom front nose portions that provide a relatively low-energy absorber that contacts an impacted object, and then during a further continuing impact stroke, the top, middle, and bottom horizontal sections crush to provide an increase energy absorption. Specifically, the UK patent application does not expressly, implicitly or inherently disclose an energy absorber that provides two levels of energy absorption. Accordingly, claim 1 is in condition for allowance.

Furthermore, claims 5-6 depend from claim 1, and since claim 1 defines unobvious patentable subject matter, claims 5-6 define unobvious patentable subject matter.

#### Claims 7 and 8

Claim 7 depends from claim 1 and further defines the top and bottom nose portions as being semi-rigid but collapsible with a parallelogram motion that shifts one or both of the upper and lower front walls vertically, such that horizontal impact forces are converted at least in part to a vertical force upon receiving a horizontal frontal impact. The prior art of record does not disclose or suggest the above noted features of claim 7.

First, claim 7 depends from claim 1, and since claim 1 defines unobvious patentable subject matter as discussed above, claim 7 defines patentable subject matter. Second, the prior art of record does not disclose or suggest top and bottom nose portions that are semi-rigid but collapsible with a parallelogram motion that shifts one or both of the upper and lower front walls vertically. According to the Office Action, “[i]mpact with an object of the shape of a knee would inherently shift the nose portions upwardly and downwardly as claimed.” However, claim 7 does not state that the top and bottom nose portions are impacted with an object in the shape of a knee. Claim 7 states that horizontal impact forces are converted at least in part to a vertical force upon receiving a horizontal frontal impact. The energy absorber as disclosed in the UK patent application includes front planar walls. Therefore, any horizontal impact forces would not be converted into at least in part a vertical force, but the horizontal force would remain a horizontal force. Furthermore, claim 8 depends from claim 7, since claim 7 defines unobvious patentable subject matter, claim 8 defines unobvious patentable subject matter.

Applicant : Darin Evans  
Appln. No. : 10/715,002  
Page : 14

#### Claim 15

Claim 15 defines a method including, among other things, constructing a bumper system including a stiff beam, and an energy absorber on a face of the beam, the energy absorber having top, middle, and bottom sections, with the top and bottom sections defining nose portions that extend forward of the middle section, the nose portions defining a space therebetween in front of the middle section, the nose portions being constructed to deflect with a parallelogram motion upon impact, and shifting at least one of the nose portions vertically with a parallelogram motion in response to an impact directed horizontally against a front of the bumper system, whereby energy directed against a knee of an impacted person is converted into a throwing force that directs the person in a direction generally perpendicular to the line of impact and away from the vehicle bumper system.

The prior art of record does not disclose or suggest the above noted features of claim 15. Specifically, as discussed above regarding claim 7, the UK patent application will not shift any nose portions of the energy absorber vertically in response to an impact directed horizontally against a front of the bumper system. Accordingly, claim 15 is in condition for allowance.

#### Claim 16

Claim 16 defines a bumper system for a vehicle including, among other things, a bumper beam for attachment to a vehicle, and an energy absorber attached to a face of the bumper beam, the energy absorber including at least one section having parallel upper and lower walls that extend generally perpendicular to the face of the bumper beam and having a main front wall and an angled front wall connecting a front edge of the upper and lower walls, the main front wall and the angled front wall forming a non-planar front surface that, upon a front impact against a pedestrian's knee, causes a structural collapse where the upper and lower walls flex with a parallelogram motion, the parallelogram motion redirecting and converting impact forces that are initially horizontal against the knee into upward vertical forces.

The prior art of record does not disclose or suggest the above noted features of claim 16. Specifically, the prior art of record does not disclose or suggest an energy absorber

Applicant : Darin Evans  
Appln. No. : 10/715,002  
Page : 15

including at least one section having parallel upper and lower walls and having a main front wall and an angled front wall connecting a front edge of the upper and lower walls.

Specifically, the UK patent application does not disclose a main front wall and an angled front wall connecting front edges of upper and lower walls. Furthermore, the prior art of record does not disclose or suggest a main front wall and an angled front wall forming a non-planar front surface that redirects and converts impact forces that are initially horizontal into upward vertical forces. Specifically, as discussed above with regard to claim 7, the UK patent application does not disclose or suggest an energy absorber that can convert forces that are initially horizontal into upward vertical forces. Accordingly, claim 16 is in condition for allowance.

Claims 17-20 depend from claim 16, and since claim 16 defines unobvious patentable subject matter, claims 17-20 define patentable subject matter. Accordingly, claims 17-20 are in condition for allowance.

#### Claim 21

Claim 21 defines a bumper system for a vehicle including, among other things, a bumper beam for attachment to a vehicle, and an energy absorber attached to a face of the bumper beam, the energy absorber including at least one section having parallel upper and lower walls that extend generally perpendicular to the face of the bumper beam and having a front wall, the upper and lower walls being elongated and longer than the front wall and further the upper and lower walls and the front wall being joined to collapse with a parallelogram motion so that, upon a front impact against a pedestrian's knee and leg, the upper and lower walls flex with a parallelogram motion, the parallelogram motion redirecting and converting impact forces that are initially horizontal against the knee into vertical forces less damaging to the pedestrian's knee and leg.

The prior art of record does not disclose or suggest the above noted features of claim 21. Specifically, the UK patent application does not disclose or suggest upper and lower walls and a front wall of an energy absorber being joined to collapse with a parallelogram motion and upper and lower walls that flex with a parallelogram motion that redirects and converts

Applicant : Darin Evans  
Appln. No. : 10/715,002  
Page : 16

impact forces that are initially horizontal against a knee into vertical forces. As discussed above regarding claim 7, the energy absorber of the UK patent application does not redirect or convert impact forces that are initially horizontal into vertical forces. Accordingly, claim 21 is in condition for allowance.

**C. Rejection of Claim 3 as Being Unpatentable Under 35 U.S.C. §103(a) Over the UK Patent Application**

Claim 3 has been rejected under 35 U.S.C. §103(a) as being unpatentable over the UK patent application. Claim 3 depends from claim 1, and since claim 1 defines unobvious patentable subject matter, claim 3 defines patentable subject matter. Accordingly, claim 3 is in condition for allowance.

**D. Rejection of Claim 4 as Being Unpatentable Under 35 U.S.C. §102(b) or 35 U.S.C. §103(a) Over the UK Patent Application**

Claim 4 has been rejected under 35 U.S.C. §102(b) or 35 U.S.C. §103(a) as being unpatentable over the UK patent application. Claim 4 depends from claim 1, and since claim 1 defines unobvious patentable subject matter, claim 4 defines patentable subject matter. Accordingly, claim 4 is in condition for allowance.

**E. Rejection of Claims 9 and 11-14 as Being Unpatentable Under 35 U.S.C. §103(a) Over the UK Patent Application in view of U.S. Patent No. 5,092,512 to Sturrus et al.**

Claims 9 and 11-14 have been rejected under 35 U.S.C. §103(a) as being unpatentable over the UK patent application in view of the Sturrus et al. '512 patent. The requirements for making a *prima facie* case of obviousness are described in MPEP §2143 as follows:

In order to establish a *prima facie* case of obviousness, three criteria must be met. M.P.E.P. § 706.02(j). Firstly, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. *In re Fine*, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988).



Applicant : Darin Evans  
Appln. No. : 10/715,002  
Page : 17

Secondly, there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 231 U.S.P.Q. 375 (Fed. Cir. 1986). Thirdly, the prior art reference (or references) must teach or suggest all the claim limitations. *In re Royka*, 180 U.S.P.Q. 580 (C.C.P.A. 1974).

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).

In proceedings before the Patent and Trademark Office, the Examiner bears the burden of establishing a prima facie case of obviousness based upon the prior art. *In re Fritch*, 23 USPQ 2d 1780, 1783 (Fed. Cir. 1992); M.P.E.P. §2142. Applicants respectfully assert that the Examiner has not yet met the Examiner's burden of establishing a prima facie case of obviousness with respect to the rejected claims. Consequently, the Examiner's rejection of the subject claims is inappropriate, and should be withdrawn.

#### Claims 9 and 11-14

Claim 9 defines a bumper system for a vehicle including, among other things, a beam adapted for attachment to a vehicle and having a longitudinal curvature that, when viewed from above in a vehicle-mounted position, is shaped to match an aerodynamic curvilinear shape of a front of the vehicle; an energy absorber engaging a face of the beam; the energy absorber having a top horizontal section defined by a top wall and an upper-mid wall connected by an upper-front wall, and having a bottom horizontal section defined by a bottom wall and a lower-mid wall connected by a lower-front wall, the top and bottom horizontal sections including top and bottom front nose portions that extend forwardly; the top and bottom nose portions each being semi-rigid but collapsible with a parallelogram motion that shifts one or both of the top and bottom front walls vertically, such that horizontal impact forces are converted at least in part to a vertical force upon receiving a horizontal frontal impact during an initial stroke of the

Applicant : Darin Evans  
Appln. No. : 10/715,002  
Page : 18

frontal impact; whereby, during a first part of the frontal impact, the top and bottom front nose portions provide a relatively low-energy absorption that “catches” an impacted object such as a knee of a human being, and then during a further continuing impact stroke, the top and bottom horizontal sections crush to provide an increased energy absorption.

The prior art of record does not disclose or suggest the above noted features of claim 9. Specifically, the prior art of record does not disclose or suggest top and bottom front nose portions each being semi-rigid but collapsible with a parallelogram motion that shifts one or both of upper-front and lower-front walls vertically, such that horizontal impact forces are converted at least in part to a vertical force upon receiving a horizontal frontal impact during an initial stroke of the frontal impact. As discussed above regarding claim 7, the UK patent application does not include an energy absorber that would convert a horizontal impact force into at least in part to of a vertical force. Furthermore, the prior art of record does not disclose or suggest an energy absorber that during a first part of a frontal impact has top and bottom front nose portions providing a relatively low-energy absorption that contacts an impacted object, and then during a further continuing impact stroke, the top and bottom horizontal sections crush to provide an increased energy absorption. Specifically, as discussed above regarding claim 1, the UK patent application does not disclose two levels of energy absorption. Therefore, the UK patent application, even when combined with the Sturrus et al. ‘512 patent, will not include all the features of claim 9. Accordingly, claim 9 is in condition for allowance.

Claims 11-14 depend from claim 9, and since claim 9 defines unobvious patentable subject matter, claims 11-14 define patentable subject matter. Accordingly, claims 11-14 are in condition for allowance.

**F. Rejection of Claims 2 and 10 as Being Unpatentable Under 35 U.S.C. §103(a) Over the UK Patent Application in view of the Japanese ‘848 publication or Over the UK Patent Application in view of the Sturrus et al. ‘512 patent and the Japanese ‘848 publication**

Applicant : Darin Evans  
Appln. No. : 10/715,002  
Page : 19

Claims 2 and 10 have been rejected under 35 U.S.C. §103(a) as being unpatentable over the UK patent application in view of the Japanese 848 publication or over the UK patent application in view of the Sturris et al. '512 patent and the Japanese '848 publication. The requirements for making a *prima facie* case of obviousness are described in MPEP §2143 as follows:

In order to establish a *prima facie* case of obviousness, three criteria must be met. M.P.E.P. § 706.02(j). Firstly, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. *In re Fine*, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). Secondly, there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 231 U.S.P.Q. 375 (Fed. Cir. 1986). Thirdly, the prior art reference (or references) must teach or suggest all the claim limitations. *In re Royka*, 180 U.S.P.Q. 580 (C.C.P.A. 1974).

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaack*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).

In proceedings before the Patent and Trademark Office, the Examiner bears the burden of establishing a *prima facie* case of obviousness based upon the prior art. *In re Fritch*, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992); M.P.E.P. §2142. Applicants respectfully assert that the Examiner has not yet met the Examiner's burden of establishing a *prima facie* case of obviousness with respect to the rejected claims. Consequently, the Examiner's rejection of the subject claims is inappropriate, and should be withdrawn.

## Claim 2

Claim 2 depends from claim 1 and further defines the top and bottom walls as defining wavy and undulating surfaces. The prior art of record does not disclose or suggest the above noted features of claim 2.

Applicant : Darin Evans  
Appln. No. : 10/715,002  
Page : 20

First, claim 2 depends from claim 1, and since claim 1 defines unobvious patentable subject matter as discussed above, claim 2 defines patentable subject matter. Second, in regard to the first criterion of obviousness, there is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the reference teachings. According to the Office Action;

It would have been obvious to one of our ordinary skill to provide in the references above a wavy top and bottom walls as taught by [the Japanese '848 publication] in order to add additional protection for pedestrians upon impact to those locations.

Paragraph 10, page 6 of the Office Action mailed September 29, 2004. However, nowhere in the Japanese '848 publication or in any of the references cited in the Office Action is it taught that wavy top and bottom walls provide additional protection for pedestrians upon impact to those locations. As stated above, the teaching or suggestion to make a claim combination must be found in the prior art, not in Applicant's disclosure, and such motivation as set forth in the Office Action is not found in the cited references.

Third, in regard to the third criterion of obviousness, even if there was a suggestion or motivation for making the combination as set forth in the Office Action, such combination would not include all of the features of claim 2. Claim 2 states that the top and bottom walls define wavy and undulating surfaces. However, the Japanese '848 publication does not disclose any wavy top and bottom walls. Notably, the Office Action has not pointed out any wavy top and bottom walls. Furthermore, the bumper cover 2, the energy absorber 4 and the bumper frame 1 as disclosed in the Japanese '848 publication all include flat top and bottom planar walls. Accordingly, claim 2 is in condition for allowance.

#### Claim 10

Claim 10 depends from claim 9 and further defines the top and bottom walls as being wavy. The prior art of record does not disclose or suggest the above noted features of claim 10.

First, claim 10 depends from claim 9, and since claim 9 defines unobvious patentable subject matter as discussed above, claim 10 defines patentable subject matter. Second, in

Applicant : Darin Evans  
Appln. No. : 10/715,002  
Page : 21

regard to the first criterion of obviousness, there is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the reference teachings. According to the Office Action;

It would have been obvious to one of our ordinary skill to provide in the references above a wavy top and bottom walls as taught by [the Japanese '848 publication] in order to add additional protection for pedestrians upon impact to those locations.

Paragraph 10, page 6 of the Office Action mailed September 29, 2004. However, nowhere in the Japanese '848 publication or in any of the references cited in the Office Action is it taught that wavy top and bottom walls provide additional protection for pedestrians upon impact to those locations. As stated above, the teaching or suggestion to make a claim combination must be found in the prior art, not in Applicant's disclosure, and such motivation as set forth in the Office Action is not found in the cited references.

Third, in regard to the third criterion of obviousness, even if there was a suggestion or motivation for making the combination as set forth in the Office Action, such combination would not include all of the features of claim 10. Claim 10 states that the top and bottom walls are wavy. However, the Japanese '848 publication does not disclose any wavy top and bottom walls. Notably, the Office Action has not pointed out any wavy top and bottom walls. Furthermore, the bumper cover 2, the energy absorber 4 and the bumper frame 1 as disclosed in the Japanese '848 publication all include flat top and bottom planar walls. Accordingly, claim 10 is in condition for allowance.

**G. Rejection of Claims 22-26 as Being Unpatentable Under 35 U.S.C. §103(a) Over the UK Patent Application in view of U.S. Patent No. 5,799,991 to Glance or Over the UK Patent Application in view of the Sturris et al. '512 Patent and U.S. Patent No. 5,799,991 to Glance**

Claims 22-26 have been rejected under 35 U.S.C. §103(a) as being unpatentable over the UK patent application in view of the Glance '991 patent or over the UK patent application in view of the Sturris et al. '512 patent and the Glance '991 patent. The requirements for making a *prima facie* case of obviousness are described in MPEP §2143 as follows:

Applicant : Darin Evans  
Appln. No. : 10/715,002  
Page : 22

In order to establish a *prima facie* case of obviousness, three criteria must be met. M.P.E.P. § 706.02(j). Firstly, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. *In re Fine*, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). Secondly, there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 231 U.S.P.Q. 375 (Fed. Cir. 1986). Thirdly, the prior art reference (or references) must teach or suggest all the claim limitations. *In re Royka*, 180 U.S.P.Q. 580 (C.C.P.A. 1974).

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).

In proceedings before the Patent and Trademark Office, the Examiner bears the burden of establishing a *prima facie* case of obviousness based upon the prior art. *In re Fritch*, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992); M.P.E.P. §2142. Applicants respectfully assert that the Examiner has not yet met the Examiner's burden of establishing a *prima facie* case of obviousness with respect to the rejected claims. Consequently, the Examiner's rejection of the subject claims is inappropriate, and should be withdrawn.

#### Claim 22

Claim 22 depends from claim 1 and further defines at least one of the top and bottom front nose portions as including a hollow area. The prior art of record does not disclose or suggest the above noted features of claim 22.

First, claim 22 depends from claim 1, and since claim 1 defines unobvious patentable subject matter as discussed above, claim 22 defines patentable subject matter. Second, there is no suggestion or motivation for combining the references as set forth in the Office Action. According to the Office Action, "[i]t would have been obvious to one of ordinary skill to provide in [the UK patent application] alone or as modified by Sturuss et al. a foam absorber

Applicant : Darin Evans  
Appln. No. : 10/715,002  
Page : 23

material as taught by Glance in order to use an absorber commercially available with known properties.” Paragraph 11, page 7 of the Office Action mailed September 29, 2004. However, if the “absorber commercially available with known properties” is the beam as disclosed in the Glance ‘991 patent, any combination of the UK patent application and the Glance ‘991 patent (either with or without being in combination with the Sturrus et al. ‘512 patent), such “commercially available” absorber would replace the absorber in the UK patent application such that the resulting combination would no longer include the features cited in the Office Action to reject the base claims upon which claim 22 depends. Furthermore, there is no suggestion or motivation for making the energy absorber 14 as disclosed in the UK patent application out of foam as one skilled in the art would realize that in an energy absorber made entirely out of the foam as disclosed in the Glance ‘991 patent would be a very large step backwards for absorbing energy compared to the energy absorber disclosed in the UK patent application, such that an energy absorber made out of that foam would be many orders of magnitude less efficient than the bumper assembly disclosed in the UK patent application. Accordingly, claim 22 is in condition for allowance.

#### Claim 23

Claim 23 depends from claim 9 and further defines at least one of the top and bottom front nose portions as including a hollow area. The prior art of record does not disclose or suggest the above noted features of claim 23.

First, claim 23 depends from claim 9, and since claim 9 defines unobvious patentable subject matter as discussed above, claim 23 defines patentable subject matter. Second, there is no suggestion or motivation for combining the references as set forth in the Office Action. According to the Office Action, “[i]t would have been obvious to one of ordinary skill to provide in [the UK patent application] alone or as modified by Sturrus et al. a foam absorber material as taught by Glance in order to use an absorber commercially available with known properties.” Paragraph 11, page 7 of the Office Action mailed September 29, 2004. However, if the “absorber commercially available with known properties” is the beam as disclosed in the Glance ‘991 patent, any combination of the UK patent application and the Glance ‘991 patent

Applicant : Darin Evans  
Appln. No. : 10/715,002  
Page : 24

(either with or without being in combination with the Sturrus et al. '512 patent), such "commercially available" absorber would replace the absorber in the UK patent application such that the resulting combination would no longer include the features cited in the Office Action to reject the base claims upon which claim 23 depends. Furthermore, there is no suggestion or motivation for making the energy absorber 14 as disclosed in the UK patent application out of foam as one skilled in the art would realize that in an energy absorber made entirely out of the foam as disclosed in the Glance '991 patent would be a very large step backwards for absorbing energy compared to the energy absorber disclosed in the UK patent application such that an energy absorber made out of that foam would be many orders of magnitude less efficient than the bumper assembly disclosed in the UK patent application. Accordingly, claim 23 is in condition for allowance.

#### Claim 24

Claim 24 depends from claim 15 and further defines at least one of the nose portions as including a hollow area. The prior art of record does not disclose or suggest the above noted features of claim 24.

First, claim 24 depends from claim 15, and since claim 15 defines unobvious patentable subject matter as discussed above, claim 24 defines patentable subject matter. Second, there is no suggestion or motivation for combining the references as set forth in the Office Action. According to the Office Action, "[i]t would have been obvious to one of ordinary skill to provide in [the UK patent application] alone or as modified by Sturrus et al. a foam absorber material as taught by Glance in order to use an absorber commercially available with known properties." Paragraph 11, page 7 of the Office Action mailed September 29, 2004. However, if the "absorber commercially available with known properties" is the beam as disclosed in the Glance '991 patent, any combination of the UK patent application and the Glance '991 patent (either with or without being in combination with the Sturrus et al. '512 patent), such "commercially available" absorber would replace the absorber in the UK patent application such that the resulting combination would no longer include the features cited in the Office Action to reject the base claims upon which claim 24 depends. Furthermore, there is no



Applicant : Darin Evans  
Appln. No. : 10/715,002  
Page : 25

suggestion or motivation for making the energy absorber 14 as disclosed in the UK patent application out of foam as one skilled in the art would realize that in an energy absorber made entirely out of the foam as disclosed in the Glance '991 patent would be a very large step backwards for absorbing energy compared to the energy absorber disclosed in the UK patent application such that an energy absorber made out of that foam would be many orders of magnitude less efficient than the bumper assembly disclosed in the UK patent application. Accordingly, claim 24 is in condition for allowance.

#### Claim 25

Claim 25 depends from claim 16 and further defines the at least one section as including a hollow area. The prior art of record does not disclose or suggest the above noted features of claim 25.

First, claim 25 depends from claim 16, and since claim 16 defines unobvious patentable subject matter as discussed above, claim 25 defines patentable subject matter. Second, there is no suggestion or motivation for combining the references as set forth in the Office Action. According to the Office Action, "[i]t would have been obvious to one of ordinary skill to provide in [the UK patent application] alone or as modified by Sturrus et al. a foam absorber material as taught by Glance in order to use an absorber commercially available with known properties." Paragraph 11, page 7 of the Office Action mailed September 29, 2004. However, if the "absorber commercially available with known properties" is the beam as disclosed in the Glance '991 patent, any combination of the UK patent application and the Glance '991 patent (either with or without being in combination with the Sturrus et al. '512 patent), such "commercially available" absorber would replace the absorber in the UK patent application such that the resulting combination would no longer include the features cited in the Office Action to reject the base claims upon which claim 25 depends. Furthermore, there is no suggestion or motivation for making the energy absorber 14 as disclosed in the UK patent application out of foam as one skilled in the art would realize that in an energy absorber made entirely out of the foam as disclosed in the Glance '991 patent would be a very large step backwards for absorbing energy compared to the energy absorber disclosed in the UK patent

Applicant : Darin Evans  
Appln. No. : 10/715,002  
Page : 26

application such that an energy absorber made out of that foam would be many orders of magnitude less efficient than the bumper assembly disclosed in the UK patent application. Accordingly, claim 25 is in condition for allowance.

#### Claim 26

Claim 26 depends from claim 21 and further defines the at least one section as including a hollow area. The prior art of record does not disclose or suggest the above noted features of claim 26.

First, claim 26 depends from claim 21, and since claim 21 defines unobvious patentable subject matter as discussed above, claim 26 defines patentable subject matter. Second, there is no suggestion or motivation for combining the references as set forth in the Office Action. According to the Office Action, “[i]t would have been obvious to one of ordinary skill to provide in [the UK patent application] alone or as modified by Sturrus et al. a foam absorber material as taught by Glance in order to use an absorber commercially available with known properties.” Paragraph 11, page 7 of the Office Action mailed September 29, 2004. However, if the “absorber commercially available with known properties” is the beam as disclosed in the Glance ‘991 patent, any combination of the UK patent application and the Glance ‘991 patent (either with or without being in combination with the Sturrus et al. ‘512 patent), such “commercially available” absorber would replace the absorber in the UK patent application such that the resulting combination would no longer include the features cited in the Office Action to reject the base claims upon which claim 26 depends. Furthermore, there is no suggestion or motivation for making the energy absorber 14 as disclosed in the UK patent application out of foam as one skilled in the art would realize that in an energy absorber made entirely out of the foam as disclosed in the Glance ‘991 patent would be a very large step backwards for absorbing energy compared to the energy absorber disclosed in the UK patent application such that an energy absorber made out of that foam would be many orders of magnitude less efficient than the bumper assembly disclosed in the UK patent application. Accordingly, claim 26 is in condition for allowance.

Applicant : Darin Evans  
Appln. No. : 10/715,002  
Page : 27

Conclusion

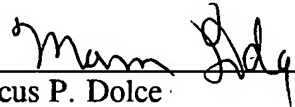
Each appealed claim is definite and recites features that are not disclosed in any of the cited references and it would not have been obvious to modify the cited references to include the recited features of the appealed claims. The references upon which the Examiner relies in the Examiner's rejection of the twice rejected claims does not disclose or suggest a bumper system with the energy absorber as claimed. Applicant's invention resolves problems and inconveniences experienced in the prior art, and therefore represents a significant advancement in the art. Applicant earnestly requests that the Examiner's rejection of claims 1-31, inclusive, be reversed, and that the application be passed to issuance forthwith.

Respectfully submitted,

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## **Appendix of Claims (37 CFR §1.192(c)(9))**

1. A bumper system for a vehicle comprising:
  - a beam for attachment to a vehicle;
  - an energy absorber engaging a face of the beam; the energy absorber having a top horizontal section defined by a top wall and an upper-mid wall connected by an upper-front wall, and having a bottom horizontal section defined by a bottom wall and a lower-mid wall connected by a lower-front wall, and further having a middle horizontal section defined by a mid-front wall connecting the upper-mid wall and the lower-mid wall, the top and bottom horizontal sections including top and bottom front nose portions that extend forward of the mid-front wall and that define a horizontal channel therebetween in front of the mid-front wall;
    - the front nose portions being configured to provide a first level of energy absorption during an initial impact stroke that collapses one or both of the front nose portions, and the top, middle, and bottom horizontal sections providing a higher second level of energy absorption during a continuing impact stroke that collapses the energy absorber against the face of the beam; and
    - a fascia covering the energy absorber and the beam;
  - whereby, during an initial front impact stroke, the top and bottom front nose portions provide a relatively low-energy absorption that contacts an impacted object, and then during a further continuing impact stroke, the top, middle, and bottom horizontal sections crush to provide an increased energy absorption.
2. The bumper system defined in claim 1, wherein the top and bottom walls define wavy and undulating surfaces.
3. The bumper system defined in claim 1, wherein the beam comprises an open channel having a height-to-depth ratio of at least 3:1.
4. The bumper system defined in claim 1, wherein the beam is rollformed.

5. The bumper system defined in claim 1, wherein the beam face defines a longitudinal forwardly-facing recess, and wherein the energy absorber includes a rearwardly-extending protruding ridge that extends into the forwardly-facing recess.

6. The bumper system defined in claim 5, wherein the middle horizontal section of the energy absorber includes the rearwardly-extending protruding ridge.

7. The bumper system defined in claim 1, wherein the top and bottom nose portions are semi-rigid but collapsible with a parallelogram motion that shifts one or both of the upper and lower front walls vertically, such that horizontal impact forces are converted at least in part to a vertical force upon receiving a horizontal frontal impact.

8. The bumper system defined in claim 7, wherein the top nose portion collapses with a parallelogram motion that shifts the upper-front wall upward during an impact.

9. A bumper system for a vehicle comprising:

a beam for attachment to a vehicle and having a longitudinal curvature that, when viewed from above in a vehicle-mounted position, is shaped to match an aerodynamic curvilinear shape of a front of the vehicle;

an energy absorber engaging a face of the beam; the energy absorber having a top horizontal section defined by a top wall and an upper-mid wall connected by an upper-front wall, and having a bottom horizontal section defined by a bottom wall and a lower-mid wall connected by a lower-front wall, the top and bottom horizontal sections including top and bottom front nose portions that extend forwardly;

the top and bottom front nose portions each being semi-rigid but collapsible with a parallelogram motion that shifts one or both of the upper-front and lower-front walls vertically, such that horizontal impact forces are converted at least in part to a vertical force upon receiving a horizontal frontal impact during an initial stroke of the frontal impact; and

whereby, during a first part of the frontal impact, the top and bottom front nose portions provide a relatively low-energy absorption that contacts an impacted object, and then during a further continuing impact stroke, the top and bottom horizontal sections crush to provide an increased energy absorption.

10. The bumper system defined in claim 9, wherein the top and bottom walls are wavy.
11. The bumper system defined in claim 9, wherein the beam comprises an open channel having a height-to-depth ratio of at least 3:1.
12. The bumper system defined in claim 9, wherein the beam is rollformed.
13. The bumper system defined in claim 9, wherein the beam face includes a longitudinal forwardly-facing recess, and the energy absorber includes a rearwardly-extending protruding ridge that extends into the forwardly-facing recess.
14. The bumper system defined in claim 13, wherein the energy absorber includes a mid-horizontal section between the top horizontal section and the bottom horizontal section, and wherein the mid-horizontal section of the energy absorber includes the rearwardly-extending protruding ridge.
15. A method comprising steps of:
  - constructing a bumper system including a stiff beam, and an energy absorber on a face of the beam, the energy absorber having top, middle, and bottom sections, with the top and bottom sections defining nose portions that extend forward of the middle section, the nose portions defining a space therebetween in front of the middle section, the nose portions being constructed to deflect with a parallelogram motion upon impact; and
  - shifting at least one of the nose portions vertically with a parallelogram motion in

response to an impact directed horizontally against a front of the bumper system, whereby energy directed against a knee of an impacted person is converted into a throwing force that directs the person in a direction generally perpendicular to the line of impact and away from the vehicle bumper system.

16. A bumper system for a vehicle comprising:  
a bumper beam for attachment to a vehicle; and  
an energy absorber attached to a face of the bumper beam, the energy absorber including at least one section having parallel upper and lower walls that extend generally perpendicular to the face of the bumper beam and having a main front wall and an angled front wall connecting a front edge of the upper and lower walls, the main front wall and the angled front wall forming a non-planer front surface that, upon a front impact against a pedestrian's knee, causes a structural collapse where the upper and lower walls flex with a parallelogram motion, the parallelogram motion redirecting and converting an impact force that is initially horizontal against the knee into an upward vertical force.
17. The bumper system defined in claim 16, wherein the upper and lower walls each have a fore-to-aft horizontal length that is substantially longer than a height of the main front wall and angled front wall, thus assisting in the parallelogram motion.
18. The bumper system defined in claim 16, wherein the at least one section includes at least an upper horizontal section and a lower horizontal section, each having a set of walls including the main front, angled front, upper and lower walls.
19. The bumper system defined in claim 18, including stabilizing walls that extend between the lower wall of the upper horizontal section and the upper wall of the lower horizontal section, and wherein the upper and lower horizontal sections extend forward of the stabilizing

walls to form upper and lower nose portions, respectively, with a forwardly facing channel therebetween.

20. The bumper system defined in claim 19, including a fascia extending over and covering the beam and the energy absorber, the fascia including a section of material that extends between the upper and lower nose portions across the channel, the fascia cooperating with the nose portions during a front impact to facilitate and help cause the parallelogram motion.

21. A bumper system for a vehicle comprising:  
a bumper beam for attachment to a vehicle; and  
an energy absorber attached to a face of the bumper beam, the energy absorber including at least one section having parallel upper and lower walls that extend generally perpendicular to the face of the bumper beam and having a front wall;  
the upper and lower walls being elongated and longer than the front wall and further the upper and lower walls and the front wall being joined to collapse with a parallelogram motion so that, upon a front impact against a pedestrian's knee and leg, the upper and lower walls flex with a parallelogram motion, the parallelogram motion redirecting and converting impact forces that are initially horizontal against the knee into vertical forces less damaging to the pedestrian's knee and leg.

22. The bumper system defined in claim 1, wherein at least one of the top and bottom front nose portions includes a hollow area.

23. The bumper system defined in claim 9, wherein at least one of the top and bottom front nose portions includes a hollow area.

24. The method defined in claim 15, wherein at least one of the nose portions includes a hollow area.



25. The bumper system defined in claim 16, wherein the at least one section includes a hollow area.

26. The bumper system defined in claim 21, wherein the at least one section includes a hollow area.

27. The bumper system defined in claim 1, wherein the walls include inner and outer surfaces.

28. The bumper system defined in claim 9, wherein the walls include inner and outer surfaces.

29. The method defined in claim 15, wherein at least one of the top, middle, and bottom sections comprise walls that include inner and outer surfaces.

30. The bumper system defined in claim 16, wherein the walls include inner and outer surfaces.

31. The bumper system defined in claim 21, wherein the walls include inner and outer surfaces.



**Related Proceedings Appendix (35 USC §41.37(c))**

There are no related appeals or interferences pending during this application.



**Evidence Appendix (35 USC §41.37(c))**

There was no evidence submitted during this application under 37 CFR §1.130, 1.131 or 1.132 or any evidence entered by the Examiner and replied upon by Appellant in the appeal.